Osteotomy of the Cervical Part of the Spine for Ankylosing Spondylitis with Severe Deformity

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OSTEOTOMY OF THE SPINE, first described by Smith-Petersen[6] in 1945, has since been done in many areas. Experience with this procedure in the United States is described by McMaster,[5] in France by Herbert,[2] and in Great Britain by Adams[1] and Law.[3] Osteotomy of the cervical part of the spine was first reported in 1953 by Mason, Cozen and Adelstein,[4] who used the procedure in a patient with ankylosing spondylitis with deformity. Herbert[2] reported three such procedures in a series of 42 cases, and undoubtedly there have been other cases in which it was used but not reported. Usually the lumbar part of the spine is the area approached in problems of this general type.

The case report given here is an example of the use of osteotomy of the cervical part of the spine in a patient with maximum deformity.

Report of a Case

A man, 55 years old, entered San Francisco General Hospital on March 23, 1963, with congestive heart failure, probably secondary to arteriosclerotic heart disease with auricular fibrillation. He responded quickly to digitalization and other supportive measures. He had a severe kyphotic fixed deformity of the cervical and lumbar regions of the spine, his chin clearing his sternum by about one inch. When walking, he was able to see ahead by looking sideways.

On March 27, the patient fell while walking in the ward and received a basilar neck fracture of the left hip. On April 11 internal fixation of the hip

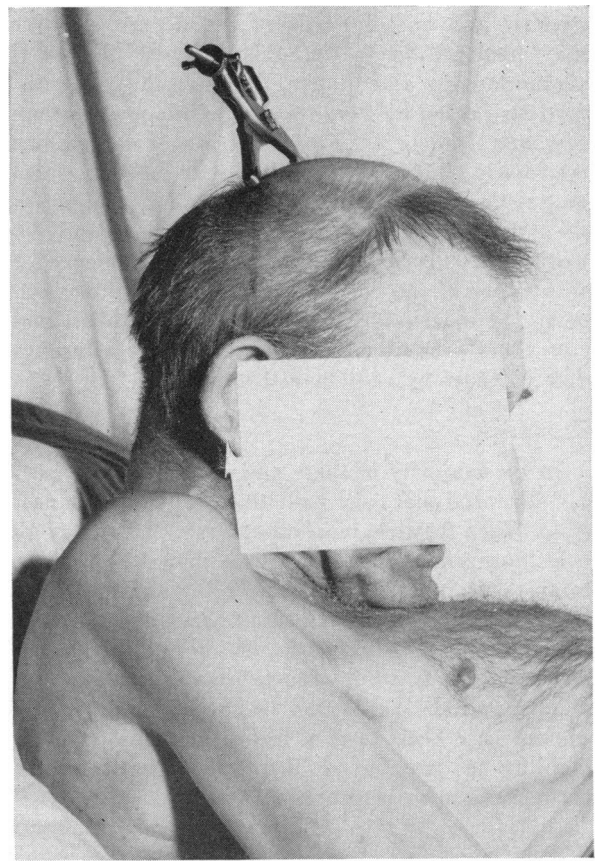

Figure 1.—Severe kyphosis bringing patient's chin in contact with sternum.

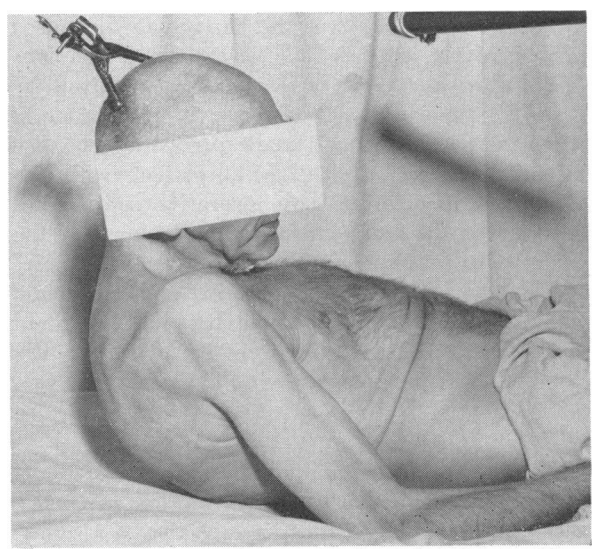

Figure 2.—Crutchfield tongs in skull for traction to hold chin away from sternum—a position not maintained when traction was relaxed.

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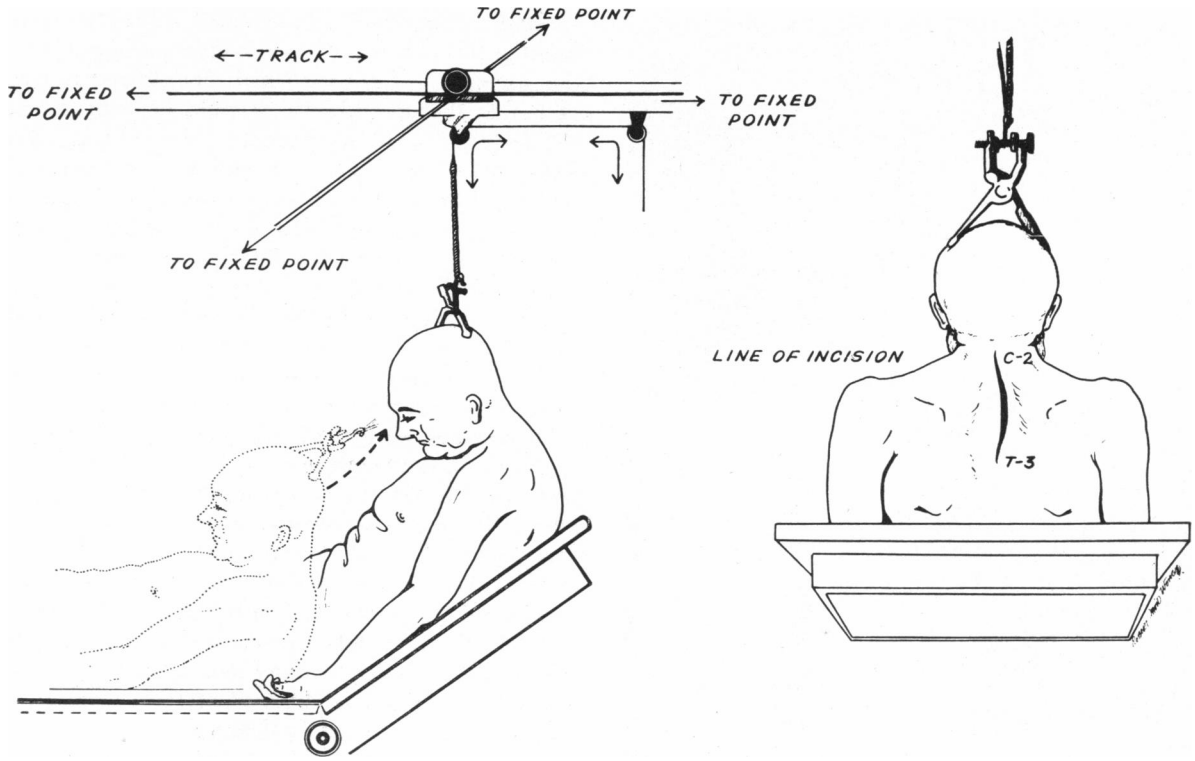

Figure 3.—Method of maintaining position of patient on table to give access to operative site.

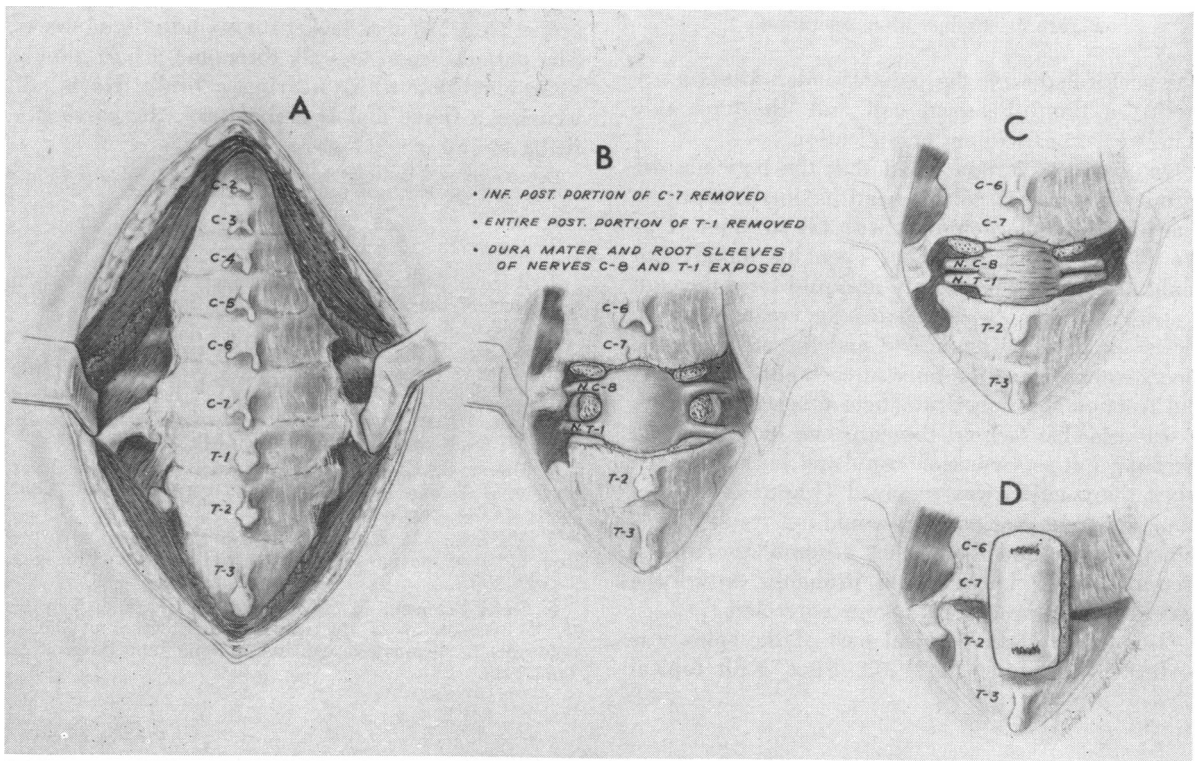

Figure 4.—Stages of operation. *A*, standard exposure of spines and lamina, exposing continuous sheet of bone. *B*, inferior portion of seventh cervical vertebra and entire posterior portion of first thoracic vertabra removed, exposing dura mater, and root sleeves of eighth cervical and first thoracic nerves. *C*, the lamina and both pedicles of the first thoracic vertebra were completely removed so that the eighth cervical and first thoracic nerve roots could approach one another as the neck was distended. *D*, use of bone chips and stainless steel wire to aid stability.

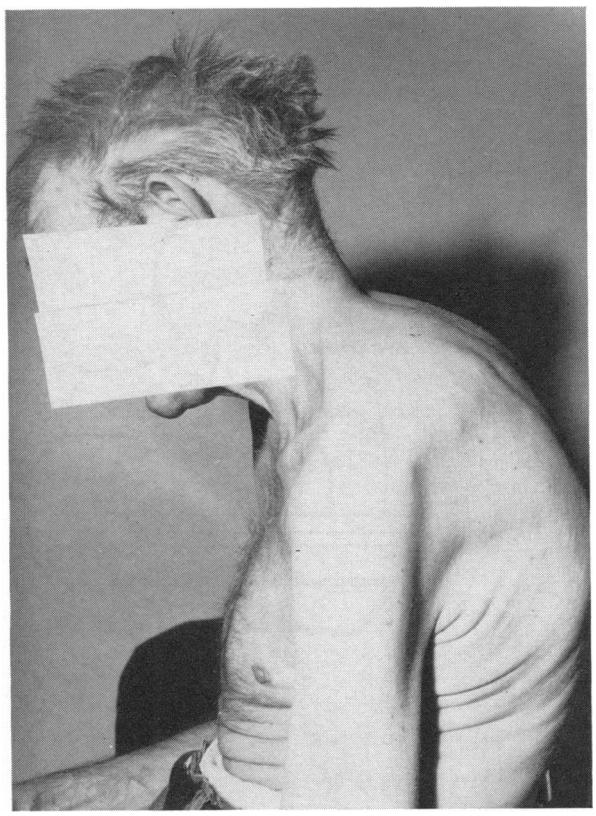

Figure 5.—Patient after operation.

was performed with the patient under spinal anesthesia; a Smith-Petersen nail and Thornton side plate were used without complication.

On April 22 it was noted that the patient's deformity had increased, his head having dropped so that his chin was in contact with his sternum (Figure 1). He could no longer open his mouth and could take nourishment only in liquid form through a straw. Pressure was sufficient to create pressure ulcers on both the mandible and the sternum, the ulcers extending to the bone at each site. With skeletal traction through Crutchfield tongs in the skull, it was possible to hold the chin one inch from the sternum, but this position could not be maintained when the traction was removed (Figure 2). It became apparent that traction would not result in sustained improvement and that accumulation of secretions in the lungs would probably drown the patient unless the deformity was corrected.

Osteotomy of the cervical part of the spine was performed on June 11, 1963. First, with topical anesthesia of the pharynx, an endotracheal tube was inserted through the nose, and then general inhalation anesthesia was established. The deformity was such that the operative area could be approached satisfactorily with the patient supine (Figure 3). Exposure of the spines and laminae, from cervical segment 4 to thoracic segment 3, was done in standard fashion. A continuous sheet of bone covered both the laminae and the interlaminal spaces. The lamina and both pedicles of thoracic vertebra 1 were completely removed so that the eighth cervical and first thoracic nerve roots could approach one another as the neck was extended. The spine and inferior one-third of the lamina of the seventh cervical segment were removed. Manual extension of the head on the trunk resulted in osteoclasis of the body of the first thoracic vertebra and adequate correction of the deformity. A stainless steel wire was passed through the spinous processes of the sixth cervical and the second thoracic vertebrae circumferentially in order to aid initial stability. Chips from the removed bone were placed at the posterior end of the closed osteotomy site (Figure 4). The amount of correction obtained at the site of osteotomy was estimated at 50 degrees.

Skeletal traction was continued and a modified Minerva plaster jacket was used for the first six weeks postoperatively. Protection was then maintained by a Minerva jacket for six additional weeks. The patient began to walk three and a half months after operation while wearing a brace. He is still wearing a brace and is ambulatory, the correction being maintained (Figure 5).

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